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Counting Tombstones is a Fallacy: Re-thinking Quality Indicators for Our Patients

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Abstract

Improving the quality of care is the goal of all clinicians. The international use of outcome data such as mortality rates is meant to improve quality. I will argue that the use of such data is flawed and will not necessarily identify the outliers in quality. To improve quality for our patients we must redesign the paradigm.

Introduction

Two major reports were published by the National Office of Clinical Audit (NOCA). These reports on hospital mortality (National Audit of Hospital Mortality) and stroke care (Irish National Audit of Stroke) will be pored over by managerial teams within the hospital service. The question to be asked - will anything change in hospitals?

The goal of monitoring clinical performance is to learn and improve. If providers regularly monitor performance and design interventions to improve, the result will be that the clinical team will deliver a quality service. Evidence exists that safety and quality within a hospital service can be improved. More than 30 years ago, Donabedian proposed measurement of the quality of health care through observation of it's structure, processes and outcomes [1].

The Institute of Medicine (IOM) has defined health care quality in the USA as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge"[2]. This definition incorporates two of Donabedian three elements in a broad approach to measurement of health care.

However, the use of data to make external judgements requires two conditions to be met. There is a moral premise that by using aggregated comparative data to make judgements this action should be fair, ie the data truly reflects underlying differences in quality. The management principle builds on this since, unfair comparisons provoke inappropriate responses.

Outcome Data

The use of outcome data is popular, it can be easily measured and is thought to be a measure of the quality of care. This notion can be traced back to Ernest Codman's end results idea[3]. This debate about the adequacy of case mix adjustment dates back to Florence Nightingale's publication of league tables for mortality in the 19th Century English hospitals[4].

Outcome data can be patient rated (satisfaction and quality of life) or recorded by an external party (morbidity and mortality). The use of outcomes to compare quality of care implies that the variation due to other causes can be accounted for, such that any residual variation truly indicates quality of care variation.

Outcome Measurements

Measuring mortality is a clearly defined end point in a patient's care. Standardised mortality ratio (SMR) is the observed number of deaths divided by the expected number of deaths in a hospital for a particular diagnosis and time period, adjusted for patient characteristics which are known to impact upon mortality.

Variation between the expected value and a result that is unlikely to have risen from random variation provides a "signal" to a hospital that their SMR is above what is expected. However, for each hospital the rate of in-hospital mortality (M) can be divided into two components

$M = U + V$

Where U denotes the mortality rate arising from deaths that could not have been avoided even under optimal care and V denotes the mortality rate arising from deaths due to suboptimal care. The burden of harm from preventable problems in care is substantial. Estimates of preventable deaths range from 3 to 6% in international studies[5,6]. Avoidable deaths has been defined as "those with at least a 50% probability of avoidability in the view of trained medical reviewers". Most preventable deaths occurred in elderly frail patients with multiple comorbidities judged to have less than 1 year of life left[7]. Hogan and colleagues subsequently demonstrated that in an examination of 34 acute hospitals in the UK, they identified that 3.6% of deaths were preventable. However, they were unable to demonstrate any association between avoidable deaths and the hospital SMR[8].

While the concept of avoidable deaths is helpful in raising interest in the scale and burden of healthcare related harm. We must be careful about using preventable deaths as a comparative measure of the quality between hospitals. Measures not robust and fair may over-estimate the size of the problem and the risks to patients by inducing unjustified levels of anxiety and fear. Secondly, they may lead to a stigmatising effect on a clinical team. Conversely under reporting may lead to complacency and a failure to acknowledge on-going risks to patients.

Correlating Quality of Clinical Care with Outcomes

In several studies researchers have found no correlation with adjusted outcomes and quality of care [9-11]. Thomas and Hofer reviewed 18 articles about the relation between outcome and clinical process and quality. They concluded that outcome has some correlation with quality but that it is a weak relationship. So that most hospitals in the highest 5% for mortality (Outliers) will not be among the 5% providing the poorest quality of care. Secondly, the 5% providing the poorest quality of care will not reside among the outliers[12].

The question is – "is it unrealistic to use outcome data to compare quality with the confidence necessary to performance management"? The answer sadly is yes! Outcome data is neither sensitive nor a specific marker for quality of care. Therefore, sanction and reward should not be applied to the "worst" 5% of providers on outcome, because they will not be the 5% with the worst quality.

Several measurable structural and institutional factors are associated with clinical outcomes. In stroke medicine, organised stroke care in a stroke unit is associated with better outcomes[13]. The benefit of a stroke unit is seen across all severities of stroke and is applicable to all stroke patients. However, as correctly pointed out by the Irish National Audit of Stroke, not all stroke patients got stroke unit care and / or spent the majority of their time in the stroke unit. However, those patients who got admitted to a Stroke Unit were more likely to have an early swallow screen and to have had an assessment of mood done.

Measuring clinical processes, therefore, offers advantages over outcome-based monitoring. Clinical process measures should be based upon agreed measures. They will guide efforts to improve performance because they are a direct measure of performance based upon adherence to established clinical standards.

The advantages of monitoring clinical processes in contrast to outcome monitoring are that it focuses on violation of agreed standards. Therefore, a failure is a failure and not an indirect / inaccurate measure. Secondly, the process can be measured close to the point of delivery of care. The target is inherent in the measurement made and finally it can be applied to all hospitals. In contrast the NAHM only provided data on 17 out of 27 (63%) hospitals providing acute stroke care. In other words, we have no data on 1 in 3 Irish hospitals.

While monitoring clinical process measures requires access to information which although would be more expensive in the short term it will be more cost effective than outcome monitoring. Mant and Hicks estimated that plausible differences in quality of care might result in a 10% difference in mortality across hospitals. Therefore, one would have to assess 3619 patients from each hospital to provide a reasonable chance of detecting this. However, only 48 cases would be needed to be assessed in each hospital to detect the corresponding difference in adherence to quality standards[14].

Conclusion

Robert McNamara (1916-2007) was the US Secretary of Defence during the presidencies of Kennedy and Johnson. He applied the same rigorous systematic analysis to the Pentagon that had worked so well in industry. He believed that if the Viet Cong causalities exceeded the numbers of US dead, the war would eventually be won. Unfortunately, the data was flawed, and history recorded a different outcome. However, McNamara's name became linked with the American failure in Vietnam and in 1972, the sociologist, Daniel Yankelovich coined the term McNamara's fallacy[15].

The first step is to measure whatever can easily be measured. This is OK as far as it goes. The second step is to disregard that which can't be measured or to give it an arbitrary quantitative value. This is artificial and misleading. The third step is to presume that what can't be measured easily really isn't important. This is blindness. The fourth step is to say that which can't be easily measured really doesn't exist. This is suicide.

Medicine is messy, imprecise and uncertain. While based upon science, it is a human activity and humans are prone to systematic cognitive bias. Given the messiness it is easier to measure whatever can be measured easily – mortality and ignore the rest. Hence, we learn to repeat McNamara's fallacy but more importantly fail to improve clinical care for our patients.

Declaration of Conflicts of Interest:
The author has no conflicts of interest to declare.

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